

**Claims for 148 (CON of 117)**

1. A system for performing anastomosis between a graft vessel and a target vessel, each having a lumen therethrough, where an opening is present in wall of the target vessel; the system comprising:

an inner element connectable to the graft vessel, wherein at least a portion of said inner element is deformable from a first configuration to a second configuration and deformable back to said first configuration from said second configuration, wherein said second configuration allows at least a portion of said inner element to enter the opening in the target vessel.

2. The system of claim 1, further comprising an outer element configured to engage said inner element to hold a portion of the graft vessel and a portion of the target vessel therebetween.

3. The system of claim 2, wherein said outer element directly engages said inner element.

4. The system of claim 2, wherein said inner element includes a curved first surface, and wherein said outer element includes a correspondingly-curved second surface, wherein an end of the graft vessel is compressed between said curved first surface of said inner element and said curved second surface of said outer element in use.

5. The system of claim 4, wherein said curved first surface and said curved second surface each have a substantially constant radius of curvature along their lengths.

6. The system of claim 2, wherein at least one of said inner element and said outer element is superelastic.

7. The system of claim 2, wherein at least one of said inner element and said outer element is composed at least partially of nitinol.

8. The system of claim 2, wherein said inner element includes at least one interlocking member configured to engage said outer element.

9. The system of claim 2, wherein said outer element includes at least one interlocking member configured to engage said inner element.

10. The system of claim 2, wherein each of said inner element and said outer element includes at least one interlocking member configured to engage the other.

11. A system for performing anastomosis between a graft vessel and a target vessel, each having a lumen therethrough, where an opening is present in the wall of the target vessel; the system comprising:

an elastically deformable inner element connectable to the graft vessel, said inner element deflectable from a first configuration to a second configuration and expandable from said second configuration to said first configuration, wherein said second configuration allows at least a portion of said inner element to enter the lumen of the target vessel through the opening; and

an outer element connectible to said inner element to compress a portion of the graft vessel and a portion of the target vessel therebetween.

12. The system of claim 11, wherein at least one of said inner element and said outer element is superelastic.

13. The system of claim 11, wherein at least one of said inner element and said outer element is composed at least partially of nitinol.

14. The system of claim 11, wherein said inner element includes a curved first surface, and wherein said outer element includes a correspondingly-curved second surface, wherein an end of the graft vessel is compressed between said curved first surface of said inner element and said curved second surface of said outer element in use.

15. The system of claim 14, wherein said curved first surface and said curved second surface each have a substantially constant radius of curvature along their lengths.

16. The system of claim 11, wherein said inner element includes at least one interlocking member configured to engage said outer element.

17. The system of claim 11, wherein said outer element includes at least one interlocking member configured to engage said inner element.

18. The system of claim 11, wherein each of said inner element and said outer element includes at least one interlocking member configured to engage the other.

19. A method for performing anastomosis between a graft vessel and a target vessel, each having a lumen therethrough, where an opening is present in the target vessel, comprising:

providing an outer element and an inner element;

deforming at least a portion of said inner element from an initial configuration to a compressed configuration;

inserting at least part of said inner element into the opening;

expanding at least a portion of said inner element from said compressed configuration to said initial configuration; and

compressing a portion of the target vessel and a portion of the graft vessel together between at least a portion of said inner element and at least a portion of said outer element.

20. The method of claim 19, wherein said deforming includes deforming said inner element laterally.

21. The method of claim 19, further comprising connecting the graft vessel to said outer element.

22. The method of claim 21, wherein said connecting comprises everting an end of the graft vessel about said outer element.

23. The method of claim 19, further comprising connecting said inner element to said outer element.

24. The method of claim 19, wherein said inserting includes inserting at least a portion of said inner element into the lumen of the target vessel.

25. The method of claim 19, wherein at least a portion of said inner element is superelastic, wherein said deforming includes applying a force to said inner element, and wherein said expanding includes releasing said force from said inner element.